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TITLE: Network environmental monitoring system for  
monitoring electric lock, groups hierarchically network  
environmental monitoring apparatuses, and  
displays hierarchically state of each apparatus

----- KWIC -----

Basic Abstract Text - ABTX (2):

USE - For monitoring electric equipments such as electric lock and  
ventilator connected through network such as internet and LAN.

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2005-070926

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(71)Applicant : KAWAMURA ELECTRIC INC

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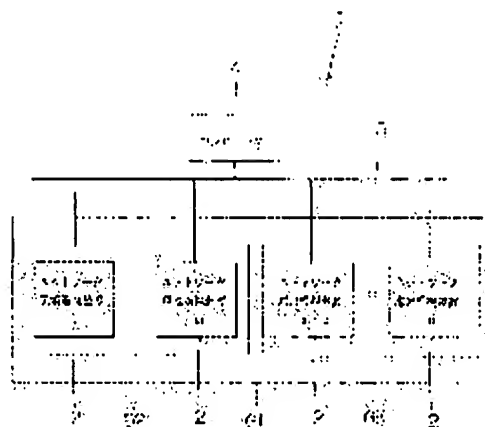
(72)Inventor : IMAI TAKESHI

## (54) NETWORK ENVIRONMENT MONITORING SYSTEM

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a network environment monitoring system which easily confirms and manages respective conditions of many network environment monitoring devices.

**SOLUTION:** A plurality of network environment monitoring devices 2 for monitoring network environment by a computer 4 are made into one group G1, and the plurality of network environment monitoring devices 2 in the group are formed into groups G2 and G3 in a plurality of hierarchies, and the information of the network environment monitoring device 2 is transmitted from the low order groups G2 and G3 to the high order group, and the condition is displayed for every hierarchy by the computer 4.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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**CLAIMS**

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[Claim(s)]

[Claim 1]

In the network environment monitoring system which performs monitor and control distantly by computer connected with the network environment supervisory equipment which supervises temperature, power, etc. by various sensors, or controls various electrical machinery and apparatus through the network Two or more network environment supervisory equipment currently supervised and controlled by said computer is made into one group. A group is formed in further two or more hierarchies for two or more network environment supervisory equipment in this group. Network environment monitoring system characterized by transmitting the information on said network environment supervisory equipment to a high order group from a low order group, and displaying a condition the whole hierarchy by said computer.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[Field of the Invention]

[0001]

This invention supervises the switching condition of temperature, humidity, power, and a door etc., or relates to the method of presentation of the network environment monitoring system distantly supervised and controlled by the computer connected with the network environment supervisory equipment which controls electrical machinery and apparatus, such as an electric lock and a ventilator, through the network.

[Background of the Invention]

[0002]

The computer which connected the computer with network environment supervisory equipment through networks, such as the Internet and LAN, and constituted, for example, installed control of electrical machinery and apparatus, such as a monitor of the switching condition of the temperature in a rack, humidity, power, and a door etc., an electric lock, and a ventilator, in remoteness is performing network environment monitoring system. When two or more network environment supervisory equipment is installed, it displays the icon of all network environment supervisory equipment on one screen, and the color of an icon is changed or a computer tells change of network environment supervisory equipment with the sound of a buzzer etc., and by choosing an icon, a window opens it and it displays detailed information (for example, nonpatent literature 1 reference.).

[Nonpatent literature 1] "Network environment supervisory equipment [online]", March, Heisei 14, Kawamura electrical machinery industrial incorporated company, [August 12, Heisei 15 retrieval], the Internet

<URL:[http://www.kawamura.co.jp/rack/lineup/rp48 / index.html](http://www.kawamura.co.jp/rack/lineup/rp48/index.html)>

[Description of the Invention]

[Problem(s) to be Solved by the Invention]

[0003]

When two or more network environment supervisory equipment of a base is installed in two or more buildings in this network environment monitoring system, respectively, Even if abnormalities occur in network environment supervisory equipment, since the icon of all network environment supervisory equipment is displayed on one screen, the display in a computer Although the icon of network environment supervisory equipment can also be arranged on a map by the network environment supervisory equipment installed in which building not knowing immediately whether abnormalities occurred, and using a background screen as the image of a map When the arrangement location of network environment supervisory equipment crowded, there was a fault that an icon lapped and it was not visible.

[Means for Solving the Problem]

[0004]

In the network environment monitoring system which performs monitor and control distantly by computer connected with the network environment supervisory equipment which this invention supervises temperature, power, etc. by various sensors, or controls various electrical machinery and apparatus through the network Two or more network environment supervisory equipment currently supervised and controlled by the computer is made into one group. A group is formed in further two or more hierarchies for two or more network environment supervisory equipment in a group, the information on network environment supervisory equipment is transmitted to a high order group from a low order group, and it is characterized by displaying a condition the whole hierarchy by computer.

[Effect of the Invention]

[0005]

The network environment monitoring system of this invention tends to check the condition of each equipment, when there is many network environment supervisory equipment, and it is effective in being easy to carry out management.

[Best Mode of Carrying Out the Invention]

[0006]

Two or more network environment supervisory equipment currently supervised by computer is made into one group, a group is formed in further two or more hierarchies for two or more network environment supervisory equipment in a group, the information on network environment supervisory equipment is transmitted to a high order group from a low order group, and a condition is displayed the whole hierarchy by computer.

[Example 1]

[0007]

The example of the network environment monitoring system concerning this invention is explained based on the accompanying drawing of drawing 1 - drawing 5.

[0008]

As shown in drawing 1, the network environment monitoring system 1 connects a computer 4 with network environment supervisory equipment 2 through the networks 3, such as the Internet and LAN, and constitutes. Network environment supervisory equipment 2 can attach various sensors in the rack for containing HUB and a server, the switching condition of temperature, humidity, power, and a door etc. can be distantly supervised by computer 4, or it can wire an electric lock, a ventilator, etc., and can control these electrical machinery and apparatus by the computer 4 distantly.

[0009]

The network environment monitoring system 1 can supervise and control two or more network environment supervisory equipment 2 by one computer 4. The display of a computer 4 makes one group the whole network environment supervisory equipment currently supervised and controlled by the computer 4, forms a group in further two or more hierarchies for the network environment supervisory equipment 2 in this group, and can display a condition now the whole hierarchy.

[0010]

When 1-n network environment supervisory equipment 2 is installed as shown in drawing 1 if the method of presentation of a computer 4 is explained in detail, these 1-n sets are made into the 1st group G1, and two or more groups are further formed in a layered structure for the inside of the 1st group, 1-m sets are made into the 2nd group G2, and m+1-n sets are made into 3rd group G3.

[0011]

Here, the group name of "CHUBU ENGINEERING CORPORATION" and 3rd group G3 is set [ the 1st group's G1 group name ] up for the group name of "Japan" and the 2nd group G2 with "Kanto." The image of the map of the Japanese Islands is set as the background screen at the time of choosing the 1st group's G1 "Japan", the image of the map of Chubu District is set as the background screen at the time of choosing the 2nd group's G2 "CHUBU ENGINEERING CORPORATION", and the image of the map of the Kanto district is set as the background screen at the time of choosing "Kanto" of 3rd group G3.

[0012]

The icon of "CHUBU ENGINEERING CORPORATION" of the 2nd group G2 is arranged to Chubu District on the map of "Japan" of the 1st group G1, and the icon of "Kanto" of 3rd group G3 is arranged to the Kanto district. Since a map will open if the icon of "CHUBU ENGINEERING CORPORATION" of the 2nd group G2 is chosen on the screen in in "Japan" of the 1st group G1, it arranges so that the icon of network environment supervisory equipment 21 - m may be corresponded with an installation on this map. If which icon of network environment supervisory equipment 21 - m is chosen, the detailed information on selected network environment supervisory equipment will be displayed.

[0013]

Moreover, since a map will open if the icon of "Kanto" of 3rd group G3 is chosen on the screen in in "Japan" of the 1st group G1, it arranges so that the icon of network environment supervisory equipment 2m+1 - n may be corresponded with an installation on this map. If which icon of network environment supervisory equipment 2m+1 - n is chosen, the detailed information on selected network environment supervisory equipment will be displayed.

[0014]

The flow chart of drawing 5 is the flow of actuation into the 2nd group G2. If it changes normally [ a condition ] from normal from abnormalities or abnormalities by any of the 2nd group's G2 network environment supervisory equipment 21 - m they are (step S1), the display of the network environment supervisory equipment which abnormalities generated will be changed (step S2). Modification of a display changes the color of an icon from green to red, or is changed from the notation of O to the notation of x.

[0015]

When the condition of network environment supervisory equipment 21 - m changes from normal unusually, (Step S3), The display of the 2nd group's G2 icon is changed into red from green noting that the 2nd group's G2 condition is unusual (step S4) (step S5). By the case where the condition of network environment supervisory equipment 21 - m is not changing from normal unusually, (Step S3), at this time, all of network environment supervisory equipment 21 - m are normal -- it comes out, and in a certain case, the display of the 2nd group's G2 icon is changed green from red noting that the condition of (step S6) and the 2nd group G2 is recovery (step S7) (step S5). Moreover, when abnormalities are in any of network environment supervisory equipment 21 - m they are, a change of (step S6) and a display is not made, but an icon is still red.

[0016]

In this way, when modification is shown in the 2nd group's G2 display, the display of the icon of (step S8) and the 1st group G1 of a high order is similarly changed into red from green (step S9), and when there is no modification in the 2nd group's G2 display, a display of (step S8) and the 1st group G1 is not changed, either.

[0017]

In addition, since the approach of the computer 4 when network environment supervisory equipment  $2m+1 - n$  have change by 3rd group G3 of operation is the same as the 2nd group's G2 approach of operation, it omits.

[0018]

In this example, although the group was formed in two hierarchies, for example the group of an all-prefectures name or a city name may be formed in the low order of the 2nd group and the 3rd group, or a group may be further formed for every building name, and there is no limitation in the number of hierarchies.

[Brief Description of the Drawings]

[0019]

[Drawing 1] It is the block diagram showing the network environment monitoring system concerning this invention.

[Drawing 2] It is the screen of the computer of the network environment monitoring system concerning this invention, and the screen which displayed the 1st group is shown.

[Drawing 3] It is the screen of the computer of the network environment monitoring system concerning this invention, and the screen which displayed the 2nd group is shown.

[Drawing 4] It is the screen of the computer of the network environment monitoring system concerning this invention, and the screen which displayed the 3rd group is shown.

[Drawing 5] It is the flow chart which shows the method of presentation of the computer of the network environment monitoring system concerning this invention.

[Description of Notations]

[0020]

1 Network Environment Monitoring System

2 Network Environment Supervisory Equipment

3 Network

4 Computer

G1 The 1st group

G2 The 2nd group

G3 The 3rd group

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TECHNICAL FIELD

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[Field of the Invention]

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**PRIOR ART**

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**[Background of the Invention]****[0002]**

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EFFECT OF THE INVENTION

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[Effect of the Invention]

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention]

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**MEANS**

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**[Means for Solving the Problem]**

**[0004]**

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DESCRIPTION OF DRAWINGS

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[Translation done.]

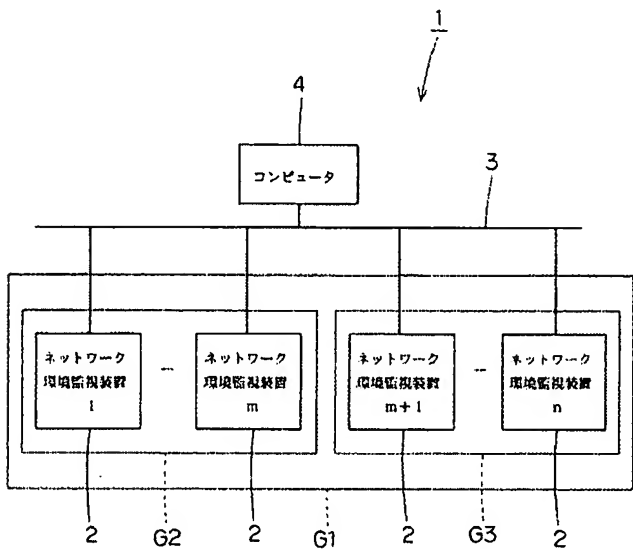
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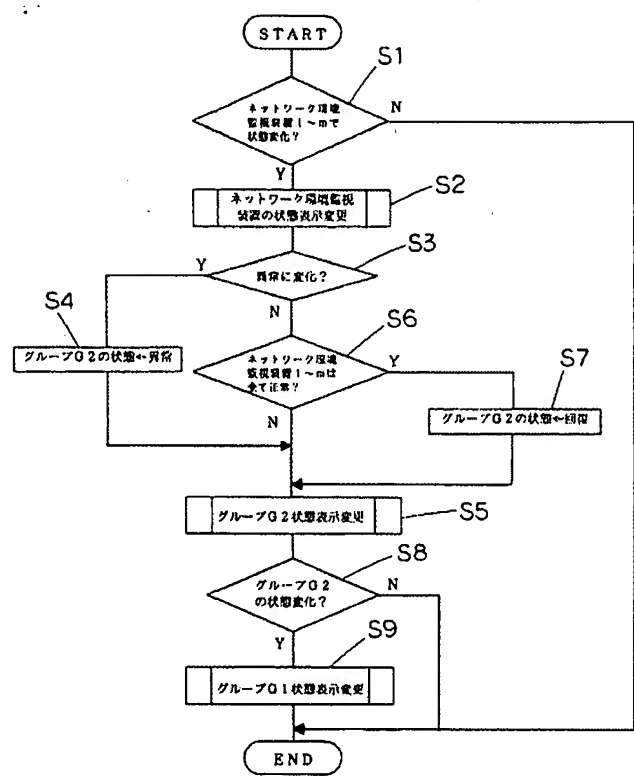
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DRAWINGS

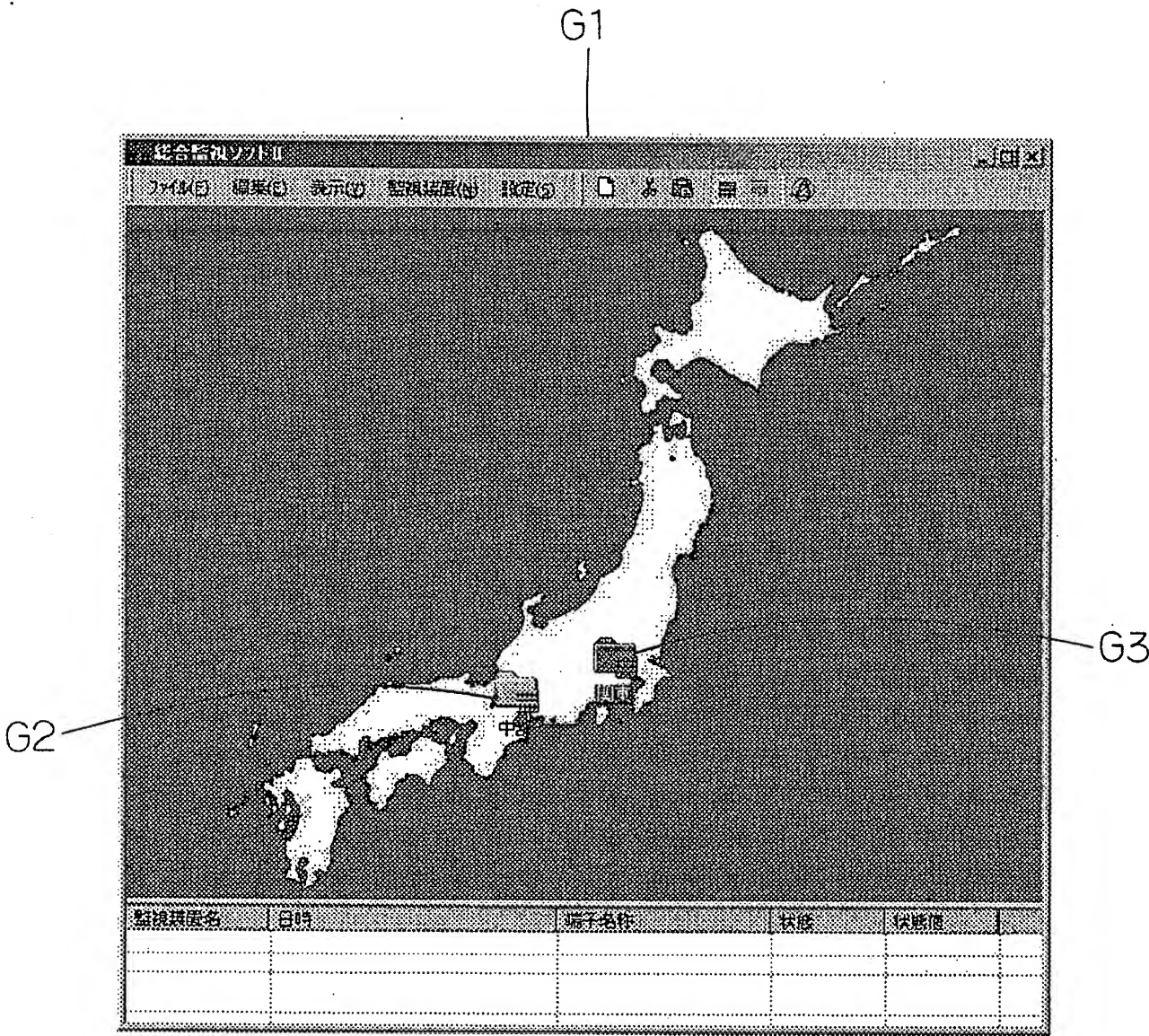
[Drawing 1]



[Drawing 5]



[Drawing 2]



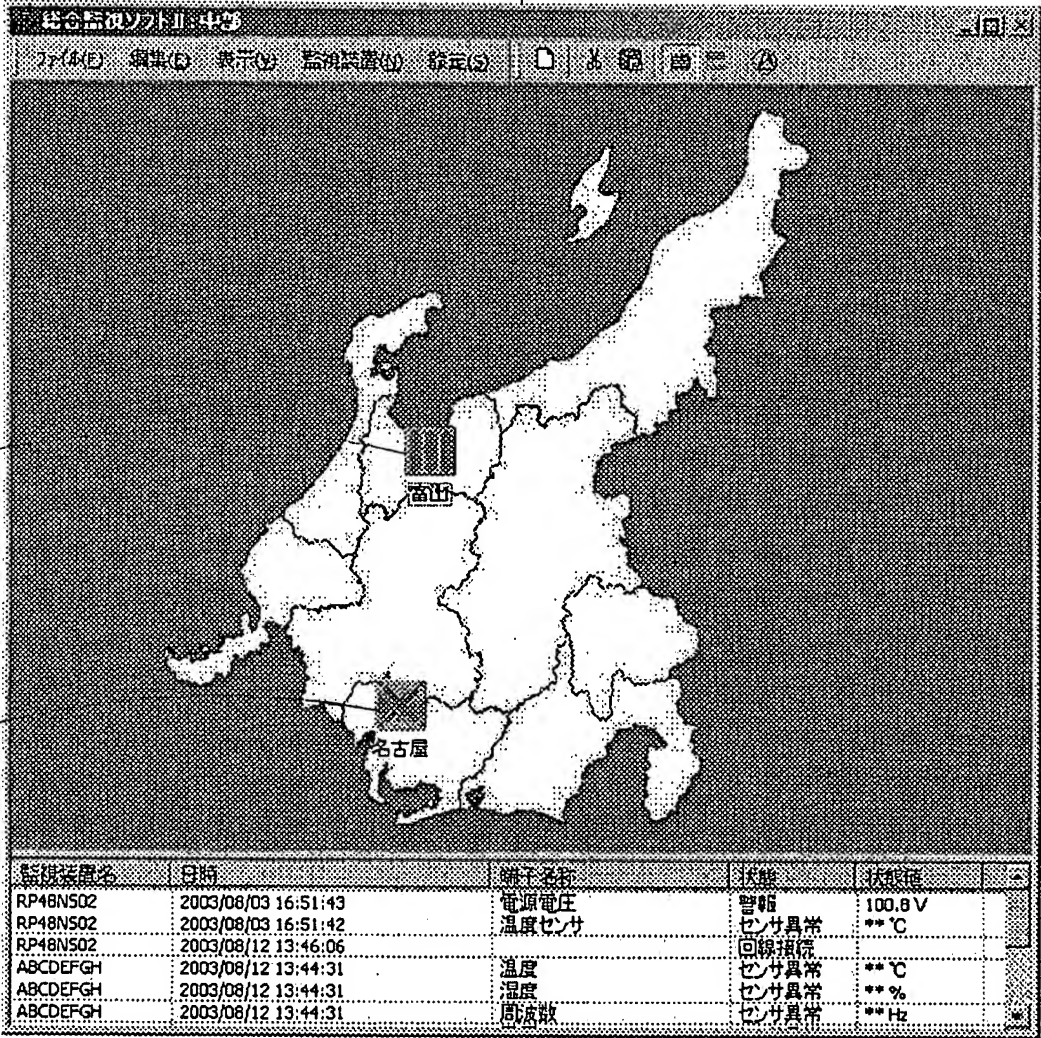
[Drawing 3]



G2

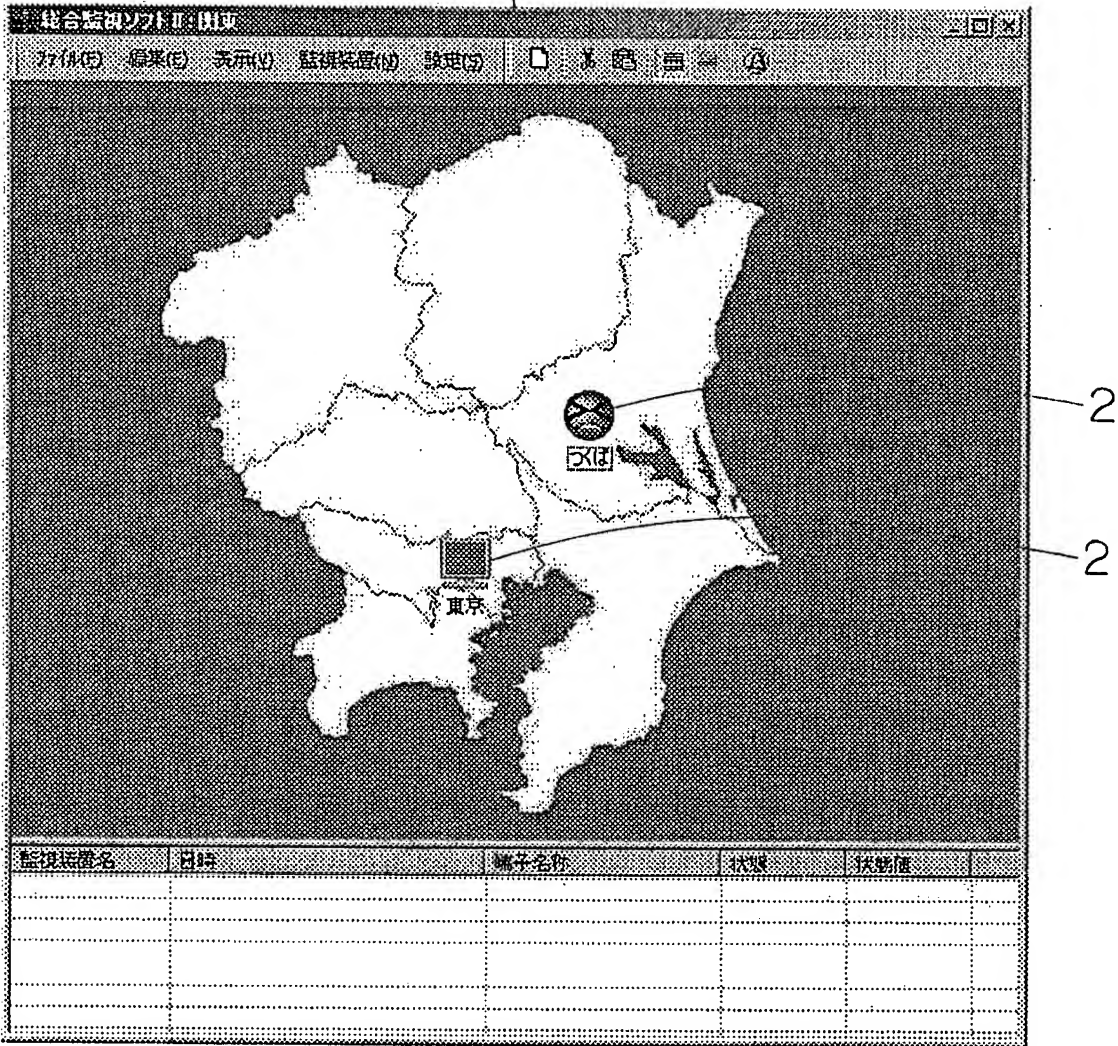
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2



[Drawing 4]

G3



[Translation done.]

(19) 日本国特許庁(JP)

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5H223

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(22) 出願日 平成15年8月21日 (2003.8.21)(71) 出願人 000124591  
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株式会社内  
Fターム(参考) 5H223 AA01 CC08 DD03 EE29

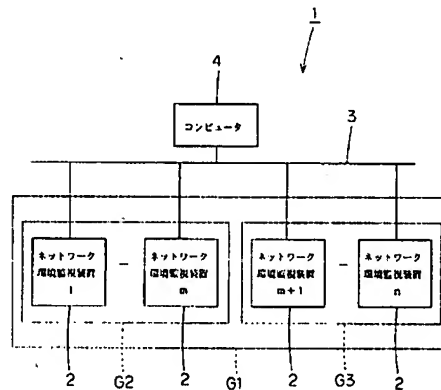
(54) 【発明の名称】 ネットワーク環境監視システム

## (57) 【要約】

【課題】 ネットワーク環境監視装置の数が多い場合に各装置の状態を確認しやすく、管理がしやすいネットワーク環境監視システムを提供する。

【解決手段】 コンピュータ4で監視している複数のネットワーク環境監視装置2を1グループG1とし、グループ内の複数のネットワーク環境監視装置2を更に複数の階層にグループG2、G3を形成し、ネットワーク環境監視装置2の情報を下位グループG2、G3から上位グループG1へ伝達し、コンピュータ4によって各階層毎で状態を表示する。

【選択図】 図1



## 【特許請求の範囲】

## 【請求項1】

各種センサによって温度や電力等を監視したり、各種電気機器の制御をするネットワーク環境監視装置とネットワークを介して接続されたコンピュータによって遠隔で監視・制御を行うネットワーク環境監視システムにおいて、前記コンピュータで監視・制御している複数のネットワーク環境監視装置を1グループとし、該グループ内の複数のネットワーク環境監視装置を更に複数の階層にグループを形成し、前記ネットワーク環境監視装置の情報を下位グループから上位グループへ伝達し、前記コンピュータによって各階層毎で状態を表示することを特徴とするネットワーク環境監視システム。

## 【発明の詳細な説明】

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## 【技術分野】

## 【0001】

本発明は、温度、湿度、電力、扉の開閉状態等を監視したり、電気錠や換気装置等の電気機器を制御するネットワーク環境監視装置とネットワークを介して接続されたコンピュータによって遠隔で監視・制御するネットワーク環境監視システムの表示方法に関する。

## 【背景技術】

## 【0002】

ネットワーク環境監視システムは、ネットワーク環境監視装置とインターネットやLAN等のネットワークを介してコンピュータを接続して構成し、例えば、ラック内の温度、湿度、電力、扉の開閉状態等の監視や、電気錠や換気装置等の電気機器の制御を遠隔に設置したコンピュータによって行っている。ネットワーク環境監視装置が複数台設置されている場合、コンピュータは一画面にすべてのネットワーク環境監視装置のアイコンを表示し、アイコンの色を変えたり、ブザー等の音によってネットワーク環境監視装置の変化を知らせ、アイコンを選択することによってウィンドウが開いて詳しい情報を表示するようになっている（例えば、非特許文献1参照。）。

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【非特許文献1】“ネットワーク環境監視装置” [online]、平成14年3月、河村電器産業株式会社、[平成15年8月12日検索]、インターネット<URL: <http://www.kawamura.co.jp/rack/lineup/rp48/index.html>>

## 【発明の開示】

## 【発明が解決しようとする課題】

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## 【0003】

このネットワーク環境監視システムにおいて、例えば、複数の建物に夫々複数台のネットワーク環境監視装置が設置されている場合、ネットワーク環境監視装置に異常が発生してもコンピュータにおける表示は一画面にすべてのネットワーク環境監視装置のアイコンが表示されているので、どの建物に設置されたネットワーク環境監視装置に異常が発生したのかすぐに分からず、また、背景画面を地図の画像にすることによって地図上にネットワーク環境監視装置のアイコンを配置することもできるが、ネットワーク環境監視装置の配置位置が密集するとアイコンが重なって見えないという欠点があった。

## 【課題を解決するための手段】

## 【0004】

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本発明は、各種センサによって温度や電力等を監視したり、各種電気機器の制御をするネットワーク環境監視装置とネットワークを介して接続されたコンピュータによって遠隔で監視・制御を行うネットワーク環境監視システムにおいて、コンピュータで監視・制御している複数のネットワーク環境監視装置を1グループとし、グループ内の複数のネットワーク環境監視装置を更に複数の階層にグループを形成し、ネットワーク環境監視装置の情報を下位グループから上位グループへ伝達し、コンピュータによって各階層毎で状態を表示することを特徴とする。

## 【発明の効果】

## 【0005】

本発明のネットワーク環境監視システムは、ネットワーク環境監視装置の数が多い場合

50

に各装置の状態を確認しやすく、管理がしやすいという効果がある。

【発明を実施するための最良の形態】

【0006】

コンピュータで監視している複数のネットワーク環境監視装置を1グループとし、グループ内の複数のネットワーク環境監視装置を更に複数の階層にグループを形成し、ネットワーク環境監視装置の情報を下位グループから上位グループへ伝達し、コンピュータによって各階層毎で状態を表示する。

【実施例1】

【0007】

本発明に係るネットワーク環境監視システムの実施例を図1～図5の添付図面に基づいて説明する。 10

【0008】

図1に示すようにネットワーク環境監視システム1は、ネットワーク環境監視装置2とインターネットやLAN等のネットワーク3を介してコンピュータ4を接続して構成している。ネットワーク環境監視装置2は、例えば、HUBやサーバーを収納するためのラックに各種センサを取り付け、温度、湿度、電力、扉の開閉状態等をコンピュータ4によって遠隔で監視したり、電気錠や換気装置等に配線し、これらの電気機器をコンピュータ4によって遠隔で制御することができる。

【0009】

ネットワーク環境監視システム1は複数のネットワーク環境監視装置2を1台のコンピュータ4で監視・制御することができる。コンピュータ4の表示は、コンピュータ4で監視・制御しているネットワーク環境監視装置全体を1つのグループとし、このグループ内のネットワーク環境監視装置2を更に複数の階層にグループを形成し、階層毎で状態を表示できるようになっている。 20

【0010】

コンピュータ4の表示方法について詳しく説明すると、図1に示すようにネットワーク環境監視装置2が1～n台設置されている場合、この1～n台を第1グループG1とし、そして第1グループ内を更に階層構造に複数のグループを形成して、1～m台を第2グループG2、m+1～n台を第3グループG3としている。

【0011】

ここで、例えば、第1グループG1のグループ名を「日本」、第2グループG2のグループ名を「中部」、第3グループG3のグループ名を「関東」と設定する。第1グループG1の「日本」を選択した際の背景画面に日本列島の地図の画像を設定し、第2グループG2の「中部」を選択した際の背景画面に中部地方の地図の画像を設定し、第3グループG3の「関東」を選択した際の背景画面に関東地方の地図の画像を設定する。 30

【0012】

第1グループG1の「日本」の地図上の中部地方に第2グループG2の「中部」のアイコンを配置し、関東地方に第3グループG3の「関東」のアイコンを配置する。第1グループG1の「日本」の画面で第2グループG2の「中部」のアイコンを選択すると地図が開くのでこの地図上にネットワーク環境監視装置2<sub>1</sub>～mのアイコンを設置場所と対応するように配置する。ネットワーク環境監視装置2<sub>1</sub>～mの何れかのアイコンを選択すると、選択したネットワーク環境監視装置の詳細な情報を表示するようになる。 40

【0013】

また、第1グループG1の「日本」の画面で第3グループG3の「関東」のアイコンを選択すると地図が開くのでこの地図上にネットワーク環境監視装置2<sub>m+1</sub>～nのアイコンを設置場所と対応するように配置する。ネットワーク環境監視装置2<sub>m+1</sub>～nの何れかのアイコンを選択すると、選択したネットワーク環境監視装置の詳細な情報を表示するようになる。

【0014】

図5のフローチャートは第2グループG2での動作の流れである。第2グループG2の 50

ネットワーク環境監視装置  $2_1 \sim m$  の何れかで状態が正常から異常、又は異常から正常に変化すると（ステップ S 1）、異常が発生したネットワーク環境監視装置の表示を変更する（ステップ S 2）。表示の変更は、例えば、アイコンの色を緑色から赤色に変化させたり、○の記号から×の記号に変化させている。

【0015】

ネットワーク環境監視装置  $2_1 \sim m$  の状態が正常から異常に変化した場合は（ステップ S 3）、第 2 グループ G 2 の状態が異常であるとして（ステップ S 4）第 2 グループ G 2 のアイコンの表示を緑色から赤色に変更し（ステップ S 5）、ネットワーク環境監視装置  $2_1 \sim m$  の状態が正常から異常に変化していない場合で（ステップ S 3）、このときネットワーク環境監視装置  $2_1 \sim m$  のすべてが正常である場合は（ステップ S 6）、第 2 グループ G 2 の状態が回復であるとして（ステップ S 7）第 2 グループ G 2 のアイコンの表示を赤色から緑色に変更する（ステップ S 5）。また、ネットワーク環境監視装置  $2_1 \sim m$  の何れかに異常がある場合は（ステップ S 6）、表示の変更は行わず、アイコンは赤色のままである。

【0016】

こうして、第 2 グループ G 2 の表示に変更があった場合は（ステップ S 8）、上位の第 1 グループ G 1 のアイコンの表示も同様に緑色から赤色に変更し（ステップ S 9）、第 2 グループ G 2 の表示に変更がない場合は（ステップ S 8）、第 1 グループ G 1 の表示も変更しない。

【0017】

尚、第 3 グループ G 3 でネットワーク環境監視装置  $2_{m+1} \sim n$  に変化があった場合のコンピュータ 4 の動作方法も第 2 グループ G 2 の動作方法と同様であるので省略する。

【0018】

本実施例において、グループを 2 つの階層に形成したが、例えば、第 2 グループと第 3 グループの下位に都道府県名や都市名のグループを形成したり、更に建物名毎にグループを形成しても良く、階層の数に限定はない。

【図面の簡単な説明】

【0019】

【図 1】本発明に係るネットワーク環境監視システムを示すブロック図である。

【図 2】本発明に係るネットワーク環境監視システムのコンピュータの画面であり、第 1 グループを表示した画面を示す。

【図 3】本発明に係るネットワーク環境監視システムのコンピュータの画面であり、第 2 グループを表示した画面を示す。

【図 4】本発明に係るネットワーク環境監視システムのコンピュータの画面であり、第 3 グループを表示した画面を示す。

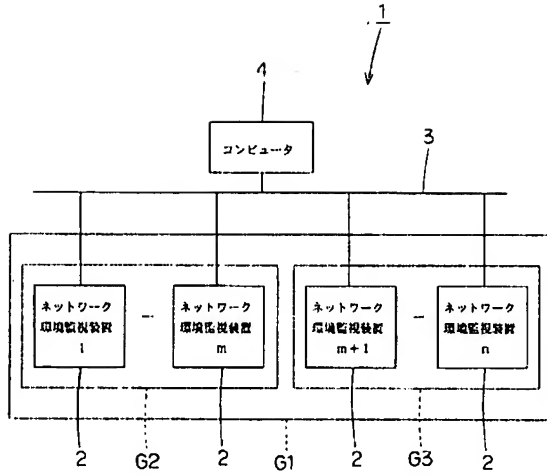
【図 5】本発明に係るネットワーク環境監視システムのコンピュータの表示方法を示すフローチャートである。

【符号の説明】

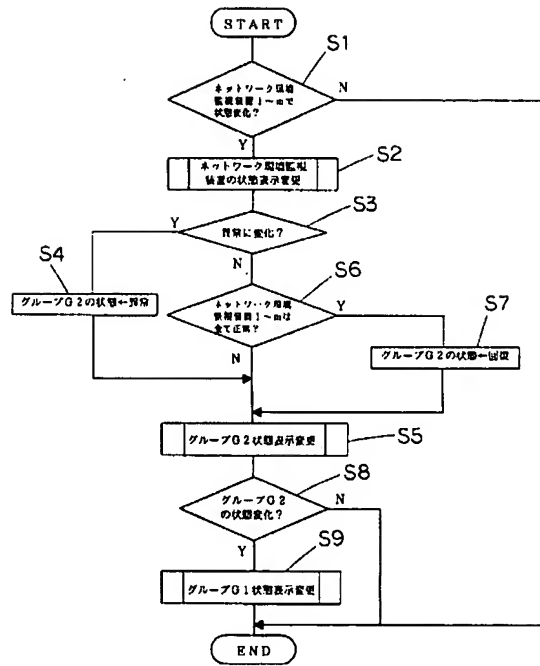
【0020】

- 1 ネットワーク環境監視システム
- 2 ネットワーク環境監視装置
- 3 ネットワーク
- 4 コンピュータ
- G 1 第 1 グループ
- G 2 第 2 グループ
- G 3 第 3 グループ

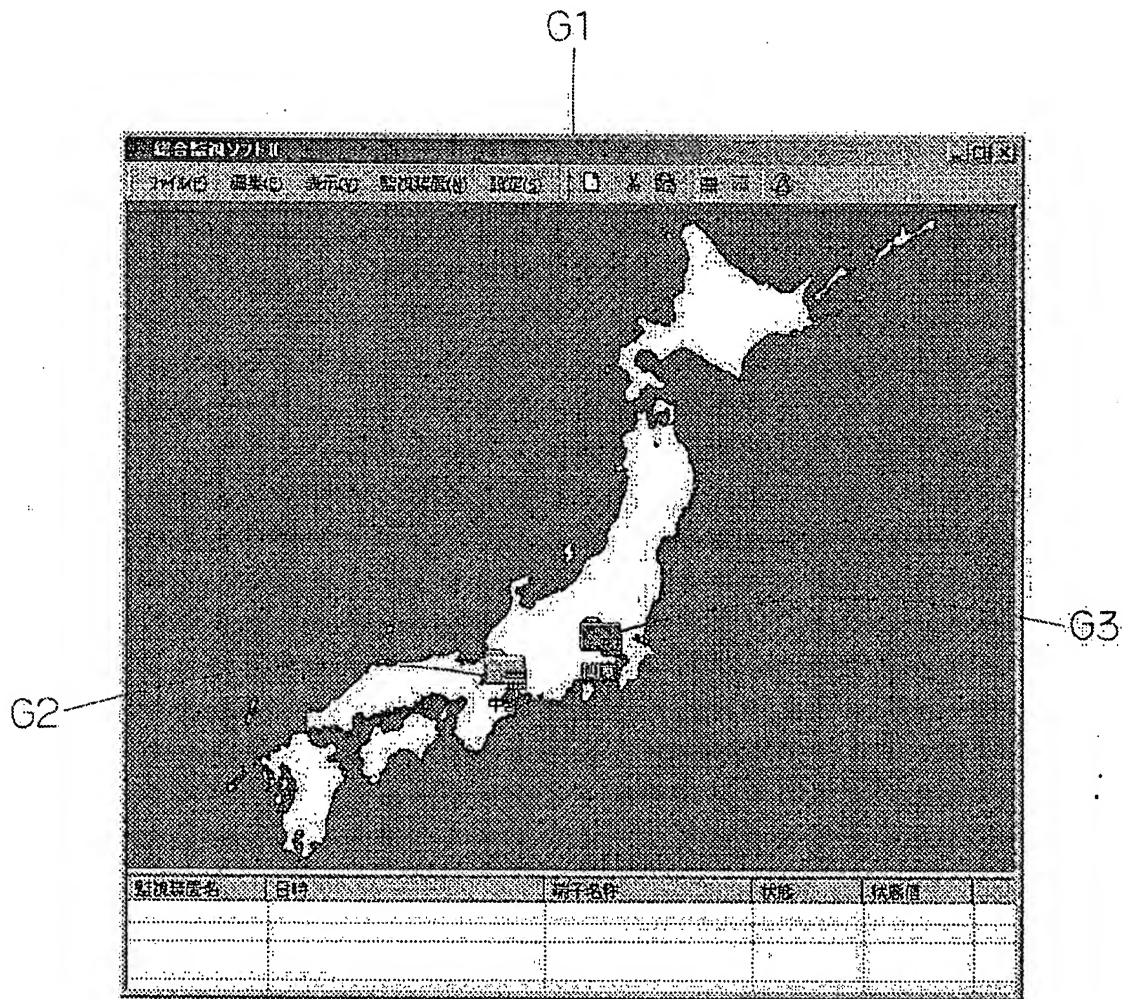
【図 1】



【図 5】



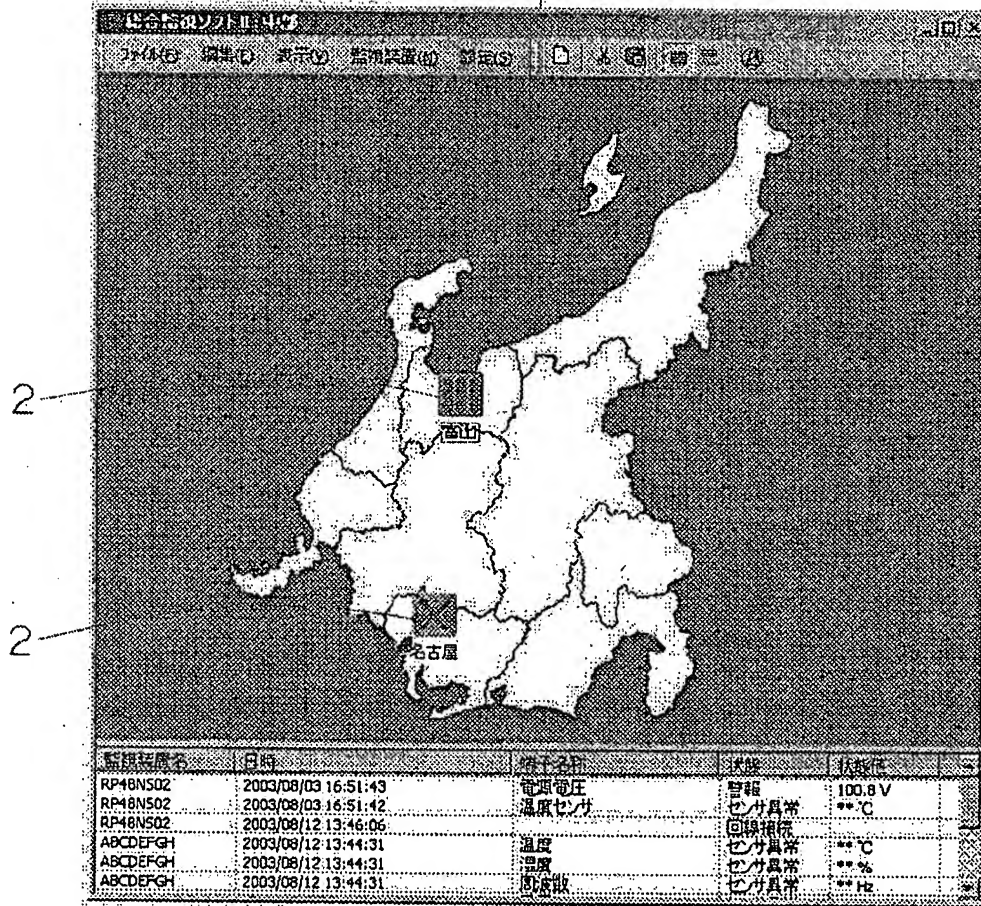
【図2】





【図3】

G2



【図 4】

